



DEPARTMENT OF THE AIR FORCE  
75TH CIVIL ENGINEER GROUP (AFMC)  
HILL AIR FORCE BASE UTAH

1287989 - R8 SDMS

30 May 2012

Environmental Restoration Branch  
75th CEG/CEVR  
7274 Wardleigh Road  
Hill Air Force Base, Utah 84056-5137

Ms. Sandra Bourgeois  
USEPA Region VIII, (EPR-FF)  
1595 Wynkoop Street  
Denver, CO 80202-1129

Mr. Muhammad Slam  
Utah Dept. of Environmental Quality  
195 North 1950 West, First Floor  
P.O. Box 144840  
Salt Lake City, UT 84114-4840

Dear Ms. Bourgeois and Mr. Slam

Attached for your signature is the *Final Removal Action Completion Report for the Second Time-Critical Removal Action for Polychlorinated Biphenyl Contaminated Soil at the Upper Area F Housing Area (OU 13) (May 2012)*. We have also enclosed three extra copies of the signature page for U. S. Environmental Protection Agency (USEPA) to sign. After signing, please send one copy back to us (Hill Air Force Base), and send one copy to Utah Department of Environmental Quality (UDEQ) and retain one for yourself. After we have received the signature page back, we will send USEPA and UDEQ a CD-Rom with the final document.

Please feel free to contact our Hill Air Force Base Project Manager, Mr. Mark Roginske at (801) 775-3651 if you have any questions regarding this document.

Sincerely

JARROD D. CASE, P.E.  
Remedial Program Manager  
Environmental Restoration Branch  
75th Civil Engineer Group

Attachments:

1. Final Removal Action Completion Report for the Second Time-Critical Removal Action for Polychlorinated Biphenyl Contaminated Soil at the Upper Area F Housing Area (OU 13) (May 2012).  
(1) Hard copy to USEPA and UDEQ.
2. Signature page (3) to USEPA



---

## **Hill Air Force Base, Utah**

---

**Final**

---

### **Removal Action Completion Report for the Second Time-Critical Removal Action for Polychlorinated Biphenyl Contaminated Soil at the Upper Area F Housing Area (OU 13)**

**May 2012**

# Removal Action Completion Report for the Second Time-Critical Removal Action for Polychlorinated Biphenyl Contaminated Soil at the Upper Area F Housing Area (OU 13)

Contract No.: FA8903-08-D-8786  
Task Order 0011

Prepared for:  
Air Force Center for Engineering and the Environment (AFCEE)  
and the Environmental Management Division (75 CEG/CEVR)  
Hill Air Force Base, Utah

Prepared by:  
North Wind, Inc.  
Idaho Falls, Idaho

MAY 2012

# Second Removal Action Completion Memorandum

## Operable Unit 13 Remedial Design/Remedial Action at Upper Area F of the Residential Military Housing

This Removal Action Report documents the completion of the Remedial Design/Remedial Action at the Operable Unit 13 (OU 13) Upper Area F of the Residential Military Housing. Construction was completed in compliance with the remedial design plans, objectives, and specifications.

Robert L. Stites 7/25/2012

Robert L. Stites  
Acting Director Federal Facilities Office  
Office of Ecosystems Protection and Remediation  
USEPA Region VIII  
1595 Wynkoop Street  
Denver, CO 80202-1129



# CONTENTS

ACRONYMS .....	vi
1. INTRODUCTION .....	1
2. SITE DESCRIPTION/OPERABLE UNIT BACKGROUND .....	1
3. REMOVAL ACTION WORK PLAN.....	2
3.1 Removal Action Requirements .....	2
3.2 Approved Variances from the Work Plan .....	3
4. REMOVAL ACTION IMPLEMENTATION.....	4
4.1 Preparatory Activities.....	4
4.1.1 Transportation, Treatment, and Disposal Services.....	4
4.1.2 Pre-Mobilization Documents .....	4
4.1.3 Installation Clearances .....	5
4.1.4 EPA and State Notification .....	5
4.1.5 Support Services.....	5
4.2 Soil Removal Activities.....	5
4.2.1 Site Security .....	5
4.2.2 Work Control Procedures.....	6
4.2.3 Excavation Activities .....	6
4.3 Confirmatory Sampling.....	7
4.3.1 Confirmatory Sampling Procedures .....	7
4.3.2 Confirmation Sample Results.....	8
4.4 Site Restoration Activities.....	8
5. PROJECT ORGANIZATION, CHRONOLOGY OF EVENTS.....	8
5.1 Project Organization.....	8
5.2 Chronology of Events.....	9
6. ATTAINMENT OF REMOVAL ACTION OBJECTIVES .....	9
7. QUALITY CONTROL MEASURES .....	9
8. RECOMMENDATIONS FOR FINAL SITE CLOSEOUT.....	10
9. FINAL INSPECTION AND CERTIFICATION .....	10
10. SUMMARY OF PROJECT COSTS.....	10
11. OBSERVATIONS AND LESSONS LEARNED .....	10
12. REFERENCES .....	11

## FIGURES

Figure 1. Hill AFB site location map. ....	F-2
Figure 2. Location of Operable Unit 13 at Hill AFB.....	F-3
Figure 3. 4111 A and B North Bridge Circle soil removal areas (April 2011). ....	F-4
Figure 4. 4114 B Charlestown Loop soil removal areas (April-May 2011).....	F-5

## TABLES

Table 1. Backfill Sample Results Summary, Backfill Material.....	T-2
Table 2. Backfill Analytical Results (grab sample collected from the Geneva Rock Products Perry Pit).....	T-3
Table 3. Confirmation Sample Results Summary, 4111B Northbridge Circle. ....	T-6
Table 4. Confirmation Sample Results Summary, 4111 A Northbridge Circle. ....	T-8
Table 5. Confirmation Sample Results Summary, 4114 B Charlestown Loop. ....	T-9

## APPENDICES (included on CD)

Appendix A—Daily Quality Control Reports, Photographic Log, and Logbook Notes

## ACRONYMS

AFB	Air Force Base
BHMH	Boyer Hill Military Housing
CAPE	CAPE, Inc.
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
cy	cubic yards
DQCR	Daily Quality Control Report
EM	Engineer Manual
EPA	Environmental Protection Agency
ER	Engineer Regulation
FSP	Field Sampling Plan
FTL	field team leader
HAZWOPER	hazardous waste operations and emergency response
MDL	method detection limit
mg/Kg	milligrams per kilogram
mg/L	milligrams per liter
MOA	Memorandum of Agreement
MS/MSD	matrix spike/matrix spike duplicate
MWH	MWH Americas, Inc.
NAD	North American Datum
ND	non-detect
NELAP	National Environmental Laboratory Accreditation Program
North Wind	North Wind, Inc.
OSHA	Occupational Safety and Health Administration
OU	operable unit

PCB	polychlorinated biphenyl
PEL	PEL – Analytical Laboratory, a Division of Spectrum Analytical, Inc., Tampa, Florida
PPE	personal protective equipment
QA	quality assurance
QA/QC	quality assurance/quality control
QAPP	Quality Assurance Project Plan
QC	quality control
RAC	removal action contractor
RCRA	Resource Conservation Recovery Act
RL	reporting limit
SSHP	Site Safety and Health Plan
TCLP	toxicity characteristic leaching procedure
TCRA	Time-Critical Removal Action
TSCA	Toxic Substances Control Act
UDEQ	Utah Department of Environmental Quality
USACE	U.S. Army Corps of Engineers
USAF	United States Air Force
VOC	volatile organic compound

## 1. INTRODUCTION

This Removal Action Completion Report documents the removal of contaminated soil located at Upper Housing Area F of the Residential Military Housing, also known as Operable Unit (OU)-13, at Hill Air Force Base (AFB), Utah. Four areas of polychlorinated biphenyl (PCB) contaminated soils beneath former hardscape surfaces (i.e., driveways, carport floors, and sidewalks) were removed and disposed between April 5 and May 9, 2011, under a Time-Critical Removal Action (TCRA). It should be noted that this was the second TCRA conducted in OU-13. The first TCRA at OU-13 was completed in July of 2008. This removal action was performed under the TCRA to meet the requirements of the Memorandum of Agreement (MOA) between Hill AFB and Boyer Hill Military Housing (BHMH) L.C. regarding post-PCB removal responsibilities in Upper Area F (Hill AFB, 2011). BHMH currently leases Upper Area F of the Residential Military Housing from the United States Air Force (USAF). The MOA stipulated that the USAF shall remove and dispose of excavated material in areas where PCBs were detected at concentrations equal to or greater than 1 milligram per kilogram (mg/Kg) beneath hardscape surfaces, concurrent with or prior to future construction/demolition activities. This removal action was performed in response to BHMH proposed construction activities. The removal action addressed areas where subsurface soil beneath hardscape surfaces had previously been identified as containing PCB concentrations equal to or greater than 1 mg/Kg. The contaminated soil beneath the hardscape surfaces was not removed during the first TCRA conducted by CH2M Hill because the associated housing was still occupied at that time. The residential screening level value is based on the Environmental Protection Agency's (EPA's) *Guidance on Remedial Actions for Superfund sites with PCB Contamination* (EPA, 1990), and also on the EPA Toxic Substances Control Act (TSCA) guidelines for removal of bulk PCBs from high-occupancy areas in 40 Code of Federal Regulations (CFR) 761.61, "PCB Remediation Waste."

This second TCRA was performed pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National Oil and Hazardous Substances Pollution Contingency Plan (40 CFR 300). Planned soil excavation areas and amounts of soil excavated and disposed of were based on previous investigation and the requirements of BHMH. Based on previously obtained analytical results, it was assumed that none of the soil to be excavated would be Resource Conservation and Recovery Act (RCRA) regulated. Previous analytical results had indicated that part of the soil to be removed would be TSCA regulated and the remainder would be non-TSCA regulated PCB containing soil (<50 mg/Kg). The removal action contractor (RAC), CAPE, Inc. (CAPE), used previously obtained PCB analytical results for hazardous waste determination. All excavated soil was excavated by the RAC, transported by Envirocare of Salt Lake City, Utah, and disposed of at the Clean Harbors facility at Grassy Mountain, Utah. The work was conducted in an environmentally acceptable manner conforming to federal, State of Utah, and local regulations. The removal action is also documented in the *Final Removal Action Report, OU-13, Removal of PCB-Contaminated Soil* (CAPE, 2011a).

## 2. SITE DESCRIPTION/OPERABLE UNIT BACKGROUND

Hill AFB is located in northern Utah, approximately 25 miles north of Salt Lake City and 5 miles south of the city of Ogden. A site location map for Hill AFB is included as Figure 1 at the back of this report. Further discussion regarding the background of OU-13 is provided in Section 2 of the Removal Action Report (CAPE, 2011a).

OU-13 (Upper Housing Area F) is one of 14 OUs that have been designated at Hill AFB as part of the CERCLA process. Upper Area F is located along the southwest boundary of Hill AFB, and currently consists of 74 residential units (37 duplexes) that were constructed in the mid-1970s. OU 13 was designated in 2007 after PCB-contaminated soil was discovered and initially investigated. Aroclor 1260 was the only PCB congener detected and OU 13 is a "soils-only" OU. In 2007 and 2008, six areas of

PCB-contaminated soil were removed and disposed under the TCRA. A total of 11 sample locations with PCB concentrations greater than 1 mg/Kg were located beneath hardscape surfaces and were left in place because the associated housing was still occupied at that time. In April 2011, BHMH demolished buildings located above and associated with some of those hardscape surfaces, specifically those located at 4111 North Bridge Circle and 4114 Charlestown Loop.

This Removal Action Completion Report documents the PCB-contaminated soil removal and disposal activities at these areas. Figures 2 through 4 illustrate the location of the Upper F Housing Area on Hill AFB and the locations and dimensions of the excavation areas.

### **3. REMOVAL ACTION WORK PLAN**

This section summarizes the implementation requirements from the *Hill AFB Upper Housing Area F PCB Removal Action Work Plan* (CH2M Hill, 2007) and the *Project Plan Addendum* (CAPE, 2011b).

#### **3.1 Removal Action Requirements**

The requirements of this removal action were to remove soil contaminated with residual PCBs from beneath the carport and driveway areas at 4111 A and B North Bridge Circle and 4114 B Charleston Loop in the Hill AFB Upper Area F Housing Area. PCB-contaminated soils were removed to prevent exposure to human and ecological receptors. The work was accomplished through excavation of soils contaminated with PCBs at concentrations at or above the EPA removal action level of 1 mg/Kg, and disposal of these soils at the Clean Harbors Grassy Mountain facility. The requirements for this removal action were to:

- Remove PCB contaminated soil (>1 mg/Kg) from the above referenced addresses;
- Conduct confirmation soil sampling to ensure that residual contaminant concentrations are below the EPA removal action level;
- Transport and dispose of contaminated soil off site in accordance with USAF protocols and state and federal regulations;
- Backfill the excavations;
- Restore the excavated areas, as required (backfill with clean fill and compact); and
- Document site-specific regulatory decisions obtained from EPA.

The Project Plan Addendum (CAPE, 2011b) provided detailed guidance for implementing the selected remedial alternative and included planning for the following actions:

1. **Preparatory Activities.** These activities included the RAC's preparation of an addendum to the Site Safety and Health Plan (SSHP) and Work Plan (CH2M Hill, 2007) containing a Field Sampling Plan (FSP) and Quality Assurance Project Plan (QAPP). Site security, spill prevention, and dust control planning was included in the Work Plan.
2. **Excavation Activities.** The Work Plan required that soil be removed such that PCB concentrations remaining in soil are less than the EPA removal action level of 1 mg/Kg. Removal of contaminated soil was generally required to a depth of 2 ft below grade. Where the action level was still exceeded, additional soil was removed to a depth of 4 ft. The intent was to remove the hazards associated with direct contact with the PCB contaminated soil according to federal and State of Utah regulations.

3. **Confirmatory Sampling and Over Excavation.** The Work Plan (CH2M Hill, 2007) defined a sampling scheme whereby composite soil samples would be collected from the bottoms and sidewalls of the excavated areas to confirm whether post-excavation contaminant concentrations exceeded the EPA removal action level. The Work Plan indicated that sidewall samples should be collected as a four-point composite for every 30 ft of sidewall. Consequently, a four-point composite sample was collected for every 30 ft of excavation sidewall by collecting four approximately equal soil subsamples into a clean disposable container, mixing the material thoroughly, and then placing the mixed material into the appropriate sample container. A five-point composite sample was to be collected for every 400 sq ft of excavation floor. Therefore, for each 400 sq ft of excavation floor, five soil subsamples of approximately equal size were collected into a clean disposable container, thoroughly mixed, and then placed into the appropriate sample container. A total of 75 confirmation soil samples were collected, including the seven quality control (QC) field duplicates and three matrix spike/matrix spike duplicates (MS/MSDs). The soil samples were collected by personnel from MWH Americas, Inc. (MWH). Confirmation sampling activities are described in Section 3.2 of the Removal Action Report (CAPE, 2011a).
4. **Soil Disposal.** Waste soil removal and disposal from the housing area required waste profiling, manifesting, and transportation to the Clean Harbors Grassy Mountain facility in accordance with all federal and state regulations. Waste characterization samples were not collected during this project since previously obtained analytical data were sufficient for the waste characterization.
5. **Site Restoration.** The excavated areas were required to be backfilled with clean soil (obtained by the RAC from Geneva Rock) and graded to ensure proper drainage. Geneva Rock collected a sample of the borrow source material on April 13, 2011. The sample was analyzed for toxicity characteristic leaching procedure (TCLP) metals, inorganics (characteristics of ignitability and reactivity), total recoverable petroleum hydrocarbons, TCLP pesticides, TCLP herbicides, TCLP semivolatile organic compounds, volatile organic compounds (VOCs) (BTEX and TPH), and TCLP VOCs. The RAC collected two samples of the backfill material on May 2, 2011 (Table 1), and had them analyzed for PCBs (Aroclor 1260). Backfill analytical results are listed in Table 2 and are included in the Cape Removal Action Report (Cape, 2011a).
6. **Documentation.** Documentation requirements included a Work Plan, an FSP, a QAPP, an SSHP, monthly progress reports, a Removal Action Report, Daily Quality Control Reports (DQCRs), the laboratory analytical report, and a Quality Assurance (QA) Report.

### 3.2 Approved Variances from the Work Plan

Minor variations from the original TCRA Work Plan (CH2M Hill, 2007) are documented in the Project Plan Addendum (CAPE, 2011b). Variations from the Project Plan Addendum are discussed below.

The RAC Project Plan Addendum had indicated that the PCB contaminated soil would be disposed of at the Wasatch Regional Landfill. The PCB contaminated soil was instead transported to, and disposed of at, the Clean Harbors Grassy Mountain facility. The excavation, disposal, and confirmation sampling activities were performed according to the original work plans (CH2M Hill, 2007).

The RAC Project Plan Addendum had indicated that equipment decontamination water would be placed in a 55-gal drum; instead, all decontamination material and water were simply added to the final truck load of soil. The soil absorbed the decontaminated water so that there was no free liquid present.

## **4. REMOVAL ACTION IMPLEMENTATION**

This section provides a summary of the removal action activities that were implemented at OU-13 in accordance with the requirements described in Section 3. Section 4.1 summarizes the preparatory work that was completed prior to the start of fieldwork; Section 4.2 describes the soil removal work; Section 4.3 describes the confirmatory sampling procedures and results; and Section 4.4 describes the site restoration activities.

### **4.1 Preparatory Activities**

This section briefly describes the preparatory activities that were conducted prior to mobilization and start of the excavation work. Preparatory activities included:

- Obtaining a notice to proceed,
- Site inspection/record review,
- Arranging for appropriate disposal services,
- Preparing project specific guidance documents,
- Obtaining dig clearances from BMMH Utilities and Blue Stakes of Utah,
- Notifying regulatory agencies, and
- Arranging for necessary support services.

#### **4.1.1 Transportation, Treatment, and Disposal Services**

The RAC arranged for transportation and disposal services. Envirocare of Salt Lake City, Utah was contracted to transport the waste soil to the disposal facility. Envirocare used 20-cubic yard (cy) end dump trucks and a few roll-off boxes. The RAC provided excavation, subcontractor surveying, and site restoration services.

Clean Harbors Grassy Mountain facility was contracted to provide treatment and disposal services. Clean Harbors operates a licensed disposal (subtitle D landfill) facility at Grassy Mountain, Utah and was selected to receive the PCB contaminated soil. A small amount of the soil (approximately 60 cy) removed from 4111 B North Bridge Circle was TSCA regulated material. The remainder of the soil removed was non-TSCA regulated material. Soil removed was managed according to applicable requirements for transportation, treatment, and disposal of non-hazardous PCB contaminated soil.

#### **4.1.2 Pre-Mobilization Documents**

The RAC performed preparatory work, which included developing field guidance documents and arranging for suppliers and services. The following pre-mobilization documents were prepared and submitted for USAF approval prior to performing the removal action:

- SSHP addendum,
- Work Plan addendum to the existing CH2M Hill Work Plan (2007) containing the following:



- FSP,
- QAPP,
- Site security planning,
- Dust control planning,
- Spill prevention planning, and
- Removal action schedule.

#### **4.1.3 Installation Clearances**

Utility clearances were obtained from Blue Stakes and BHMH prior to performing any excavation fieldwork. The Blue Stakes dig ticket number was C10890078.

#### **4.1.4 EPA and State Notification**

Prior to the start of fieldwork, EPA and the Utah Department of Environmental Quality (UDEQ) were notified of the schedule of activities.

#### **4.1.5 Support Services**

MWH of Salt Lake City, Utah provided confirmatory soil sampling fieldwork as a subcontractor to the RAC. The RAC and MWH worked with PEL - Analytical Laboratory, a Division of Spectrum Analytical, Inc., Tampa, Florida (PEL) to ensure all quality assurance/quality control (QA/QC) procedures were met. North Wind, Inc. (North Wind) performed Title II oversight for the USAF.

Bush and Gudgeon, Inc. of Salt Lake City, Utah provided surveying services after completion of excavation and after confirmatory sampling.

Services were also arranged from a number of local suppliers for items such as equipment rental, equipment fueling, and sanitation in preparation for the field activities.

### **4.2 Soil Removal Activities**

This section describes the fieldwork performed at OU-13, including site security measures, work control procedures, and excavation activities.

#### **4.2.1 Site Security**

Security controls had previously been installed at the site by BHMH in the form of chain-link fencing.

Visitors were required to present evidence of meeting the training requirements of 29 CFR 1910.120 (40-hr hazardous waste operations and emergency response [HAZWOPER], 24-hr supervised field experience, and 8-hr refresher, as applicable), undergo site-specific training, and present evidence of medical surveillance, as specified in the SSHP (CH2M Hill, 2007). In addition, visitors were required to wear personal protective equipment (PPE), as specified in the SSHP. In general, visitors were kept outside the work areas.

#### **4.2.2 Work Control Procedures**

The RAC worked under the existing SSHP. The SSHP was developed in accordance with the requirements in U.S. Army Corps of Engineers (USACE) Engineer Regulation (ER) 385-1-92, "Safety and Occupational Health Document Requirements for Hazardous, Toxic, and Radioactive Waste and Ordnance and Explosive Waste Activities," and USACE Engineer Manual (EM) 385-1-1, "Safety and Health Requirements Manual."

All fieldwork was performed in accordance with the requirements and controls established in the SSHP.

#### **4.2.3 Excavation Activities**

Excavation activities at OU-13 were conducted over a 4-week period in April and May of 2011. Excavation activities are described in the Removal Action Report (CAPE, 2011a). Daily reports, a photographic log, and logbook notes are included in Appendix A. A safety briefing was held at the start of each day to allow field team members an opportunity to discuss the planned activities, associated hazards, and to make suggestions to improve the overall work processes.

An experienced crew, with current Occupational Safety and Health Administration (OSHA) hazardous waste operator qualifications, mobilized to the site on April 5, 2011, and commenced site preparations by establishing work control zones, staging equipment, and conducting preparatory inspections. The RAC painted boundary lines on the ground to guide the equipment operator. A water trailer was onsite at all times to minimize dust created in work areas during excavation activities. The soil was wet from spring rain and snow and there was additional rain and snow during the course of the excavation so no visible dust was emitted.

##### **4.2.3.1 PCB Contaminated Soil Removal**

Approximately 357 cy of PCB-contaminated soil were removed (580 tons). This included 60 cy of TSCA regulated material and 297 cy of non-TSCA regulated soil. Sections 3.1, 3.2, and 3.3 of the Removal Action Report (CAPE, 2011a) contain further discussion of the soil removal activities.

##### **4111 A and B North Bridge Circle**

Approximately 226 cy of PCB-contaminated soil were excavated and removed from 4111 A and B North Bridge Circle. Approximately 60 cy of this material was TSCA regulated waste. The TSCA regulated material was placed in roll-off boxes, placarded, manifested, and shipped to Grassy Mountain. A map of the work area illustrating the excavations is shown in Figure 3.

The remaining PCB contaminated soil (166 cy) was loaded into semi-trucks with end dumps for transport directly to Grassy Mountain. Copies of manifests and disposal tickets are included in the Removal Action Report (CAPE, 2011a).

##### **4114 B Charleston Loop**

Approximately 131 cy of PCB-contaminated soil were excavated and removed from 4114 B Charleston Loop and disposed of as non-TSCA regulated PCB containing waste. These activities are described in the Removal Action Report (CAPE, 2011a).

Excavation depths were checked during excavation activities with a tape measure and verified by a licensed surveyor.

All waste soil was disposed of at the Clean Harbors Grassy Mountain facility. Copies of the manifests, profile, and disposal weight tickets are included in the Removal Action Report (CAPE, 2011a).

A Utah licensed surveyor recorded the final excavation boundaries and sample locations. The surveyor reported the data in the North American Datum 1988 (NAD 88) Utah State Plane Coordinate System. Figures 3 and 4 illustrate the dimensions of the excavations, as recorded by a licensed surveyor.

### **Removal Action Derived Waste**

All used PPE, trash, plastic trash bags, plastic sheeting, used shop towels, and disposable sampling equipment were bagged and loaded into the trucks with the soil removed from the site. After completing the excavation of the contaminated soil, the excavator bucket was cleaned by hand over polyethylene sheeting using low pressure water sprayers, shovels, wire brushes, putty knives, and disposable wipes. All debris was rolled up in the polyethylene sheeting and added to the last soil load. The small amount of decontamination water generated was absorbed into the soil in the truck so that no free liquid waste was present.

The waste transport trucks were lined with plastic sheeting and this material was disposed of with the soil.

## **4.3 Confirmatory Sampling**

This section describes the procedures and results of confirmation sampling that were performed to determine residual levels of contamination after excavation.

### **4.3.1 Confirmatory Sampling Procedures**

The Work Plan (CH2M Hill, 2007) indicated that sidewall samples should be collected as a four-point composite for every 30 ft of sidewall. Consequently, a four-point composite sample was collected for every 30 ft of excavation sidewall by collecting four approximately equal soil subsamples into a clean disposable container, mixing the material thoroughly, and then placing the mixed material into the appropriate sample container. A five-point composite sample was to be collected for every 400 sq ft of excavation floor. Therefore, for each 400 sq ft of excavation floor, five soil subsamples of approximately equal size were collected into a clean disposable container, thoroughly mixed, and then placed into the appropriate sample container. A total of 75 confirmation soil samples were collected, including the seven QC field duplicates and three MS/MSDs. The soil samples were collected by personnel from MWH. Confirmation sampling activities are described in Section 3.2 of the Removal Action Report (CAPE, 2011a).

All required sample information was recorded on sample labels, in the logbook, and on chain of custody forms, as specified in the applicable FSP. Sample labels were covered with clear tape to prevent smearing. Samples were shipped to the laboratory on ice and all samples arrived at the laboratory in good condition. Custody seals were affixed either to the sample container or to the sample cooler lid to prevent tampering. The samples remained in the custody of the sampling team at all times until they were shipped to the laboratory via Fed Ex.

After packaging, the RAC subcontractor (MWH) immediately sent the samples to PEL, a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory. Prior to the start of fieldwork, the RAC issued a scope of work and technical requirements to the laboratory and tentatively scheduled delivery dates for the soil samples to ensure rapid turnaround. All samples arrived at the laboratory in good condition.

#### **4.3.2 Confirmation Sample Results**

Tables 3, 4, and 5 summarize the confirmation sample results. These tables also are included in the RAC Removal Action Report (CAPE, 2011a). Confirmation sample results indicated that PCB (Aroclor 1260) detections in the remaining soil ranged from non-detect (ND) to 0.83J mg/Kg. All detected concentrations in remaining soil at the site are below the EPA's removal action level of 1 mg/Kg, except for soils beneath the pavement of Charlestown Loop.

The laboratory analytical reports are provided in Appendix D of the RAC Removal Action Report (CAPE, 2011a). QC sample results are discussed in the QA Report in Appendix D of the RAC Removal Action Report (Cape, 2011a). No quality issues were identified. These data were determined to be of adequate quality to determine whether contaminant concentrations remaining in the soils at OU-13 exceed the EPA removal action level.

#### **4.4 Site Restoration Activities**

With concurrence from the USAF that the project objectives had been met, the RAC backfilled all excavations with clean imported fill. Imported clean fill was placed in 1-ft lifts and compacted to a minimum of 95% of the Modified Proctor. Samples were collected from the fill material prior to use to verify that the fill contained no chemical contaminants. No other site restoration (i.e., re-seeding) was required.

### **5. PROJECT ORGANIZATION, CHRONOLOGY OF EVENTS**

#### **5.1 Project Organization**

The project organization for the second OU-13 removal action is summarized below:

- USAF – Representatives from AFCEE and Hill AFB were involved in the approval, contracting, oversight, and public affairs associated with the removal action. These included Hill AFB 75<sup>th</sup> CEG/CEBR, Hill AFB 75<sup>th</sup> CES/CEEV, Air Force Material Command EUL Office, and the 75<sup>th</sup> ABW/PA.
- EPA – The EPA is the federal government agency overseeing the removal action and ongoing activities at OU 13. The EPA is responsible for providing technical guidance, review, and approval of project documents, and general oversight of the CERCLA process at OU 13.
- UDEQ – The UDEQ is the State of Utah government agency overseeing the remedial design/remedial action and ongoing activities at OU 13. The UDEQ works closely with the EPA in providing technical guidance, review, and approval of project documents, and general oversight of environmental investigations and remediation at OU 13.
- Cape, Inc. – Cape provides environmental engineering and consulting services to the USAF. Cape was contracted by AFCEE as the RAC for the OU-13 removal action.
- MWH – MWH provided soil sampling services to the RAC.
- North Wind, Inc. – North Wind was contracted by AFCEE to perform Title II construction oversight services during the removal action.

## **5.2 Chronology of Events**

- July 18, 2008: Completed first TCRA at OU-13.
- April 7, 2011: Began second TCRA at OU-13 to remove PCB contaminated soil that had been left beneath hardscape surfaces at occupied dwellings.
- April 20, 2011: Completed initial backfilling and site restoration.
- April 21, 2011: Final site conditions approved by Mark Roginske (Hill AFB 75 CEG/CEVR PM, and Jeff Long Boyer-Hill PM), contingent upon final sample results.
- April 25, 2011: Sample collected on April 12 indicated additional PCB contamination above the screening level in the east wall of excavation at 4114B Charleston Loop. Performed additional 20 cy excavation.
- April 28, 2011: EPA and UDEQ completed "second" TCRA inspection for OU-13.
- May 2, 2011: Hill AFB final inspection with Cape, Inc. was completed.
- May 9, 2011: Removed additional PCB contaminated soil from the east wall of the excavation at 4114B Charleston Loop because the sample collected on April 25, 2011 indicated PCB concentrations above the screening level.
- May 9, 2011: Completed final backfilling and site restoration.

## **6. ATTAINMENT OF REMOVAL ACTION OBJECTIVES**

The objective for the housing area remediation was to remove contaminated soil that could pose a potential risk to future users of this site (as discussed in Section 3.1). To achieve this objective, the RAC excavated and disposed of contaminated soil as specified in the Work Plan. Confirmation samples were then collected and analyzed to measure residual levels of contamination. The resulting analytical data were validated and determined to be of sufficient quality to meet the removal action and data quality objectives for this project. The confirmation sample results demonstrated that sufficient soil had been removed from the four areas at 4111 North Bridge Circle and 4114 Charleston Loop such that residual levels of contamination remaining in the soil are less than the EPA removal action level.

## **7. QUALITY CONTROL MEASURES**

This remediation work was controlled by plans and procedures for chemical sampling and analysis, safety and health precautions, soil removal, and waste disposal. During the preparatory phase of the project, North Wind personnel reviewed the requirements for successful completion of the work. Key documents included the Work Plan (CH2M Hill, 2007), the Work Plan Addendum (CAPE, 2011b), the SSHP/Accident Prevention Plan (CH2M Hill, 2007), and the USACE Safety and Health Requirements Manual (EM 385-1-1). Specific requirements from these documents were incorporated into the RAC's Work Plan Addendum (Cape, 2011b).

In addition to up-front identification of requirements, North Wind and the RAC prepared for the project by selecting qualified project personnel, conducting training (as necessary), and fully briefing all members of the project on the scope, objectives, and requirements necessary for a successful project.

The RAC contracted a NELAP certified analytical laboratory (PEL) to perform the analytical work in accordance with the work plans.

RAC personnel validated the analytical results and methods in accordance with the Air Force Center for Environmental Excellence (AFCEE), Appendix C: QAPP (AFCEE, 2006). Analytical QC, including the Data Validation Report, is discussed further in the QA Report included as Appendix D of the Removal Action Report (CAPE, 2011a).

During the implementation phase, the RAC provided a dedicated field team leader (FTL) who was onsite at all times and was responsible for directing the work to meet all quality requirements. The FTL inspected all aspects of the excavation, sampling, and waste transport activities to ensure the work was performed as required. North Wind provided a Title II Inspector that documented activities, measurements, and times in a detailed logbook (Appendix A) and kept a photographic record of the work (Appendix A). Particular effort was made to accurately record the excavation dimensions and locations of the confirmatory samples. MWH marked all sample locations with pin flags. A state licensed surveyor recorded the excavation dimensions and sample locations and reported the data in a standard, controlled format. Surveyed excavation locations and sample locations are illustrated in Figures 3 and 4.

## **8. RECOMMENDATIONS FOR FINAL SITE CLOSEOUT**

All confirmation soil sample results were less than the EPA removal action level of 1 mg/Kg for PCBs. No further action is required related to the PCB soil contamination in soil at 4111 North Bridge Circle and 4114 Charlestown Loop.

## **9. FINAL INSPECTION AND CERTIFICATION**

The final inspection for the second TCRA at OU-13 was held on April 28, 2011.

## **10. SUMMARY OF PROJECT COSTS**

The estimated project cost was \$257,000. The actual cost to complete the second TCRA was \$275,000.

## **11. OBSERVATIONS AND LESSONS LEARNED**

All work proceeded according to plans. There were no issues or problems.

## 12. REFERENCES

- 29 CFR 1910.120, 2002, Title 29, "Labor," Part 1910, "Occupational Safety and Health Administration," Subpart H, "Hazardous Materials," Section 1910.120, "Hazardous Waste Operations and Emergency Response," *Code of Federal Regulations*, Office of the Federal Register.
- 40 CFR 300, 1994, Title 40, "Protection of the Environment," Part 300, "National Oil and Hazardous Substances Pollution Contingency Plan, Final Rule, 59 FR 47384, 15 September 1994.
- 40 CFR 761.61, 2010, Title 40, "Protection of Environment," Part 761, "Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Subpart D Storage and Disposal," Section 761.61, "PCB Remediation Waste," *Code of Federal Regulations*, Office of the Federal Register.
- AFCEE, 2006, Air Force Center For Environmental Excellence (AFCEE), Appendix C: Quality Assurance Project Plan (QAPP), Final Version, 4.0.02, May.
- CAPE, 2011a, *Hill Air Force Base Utah, Final Removal Action Report, Operable Unit 13, Removal of PCB Contaminated Soil*, CAPE, Inc., September.
- CAPE, 2011b, *Project Plan Addendum (CDRLS A004, A005, and A007)*, CAPE, Inc., March.
- CH2M Hill, 2007, *Hill AFB Housing Upper Area F PCB Removal Action Work Plan*, September, 2007.
- EPA, 1990, *Guidance on Remedial Actions for Superfund Sites with PCB Contamination*, United States Environmental Protection Agency. Publications Number 9355.4-01, August 1990.
- Hill AFB, 2011, Memorandum of Agreement (MOA) Between Hill AFB and BHMH L.C. Regarding Post-PCB Removal Responsibilities in Upper Area F, 21 March 2011.
- USACE, Engineer Manual (EM) 385-1-1, "Safety and Health Requirements Manual," United States Army Corps of Engineers, September 3, 1996.
- USACE, Engineer Regulation (ER) 385-1-92, "Safety and Occupational Health Requirements for Hazardous, Toxic, and Radioactive Waste (HTRW) Activities," United States Army Corps of Engineers, September 1, 2001.

## FIGURES

- Figure 1 Hill AFB site location map
- Figure 2 Location of Operable Unit 13 at Hill AFB
- Figure 3 4111 A and B North Bridge Circle soil removal areas (April 2011)
- Figure 4 4114 B Charlestown Loop soil removal areas (April-May 2011).





Figure 1. Hill AFB site location map.





Figure 2. Location of Operable Unit 13 at Hill AFB.



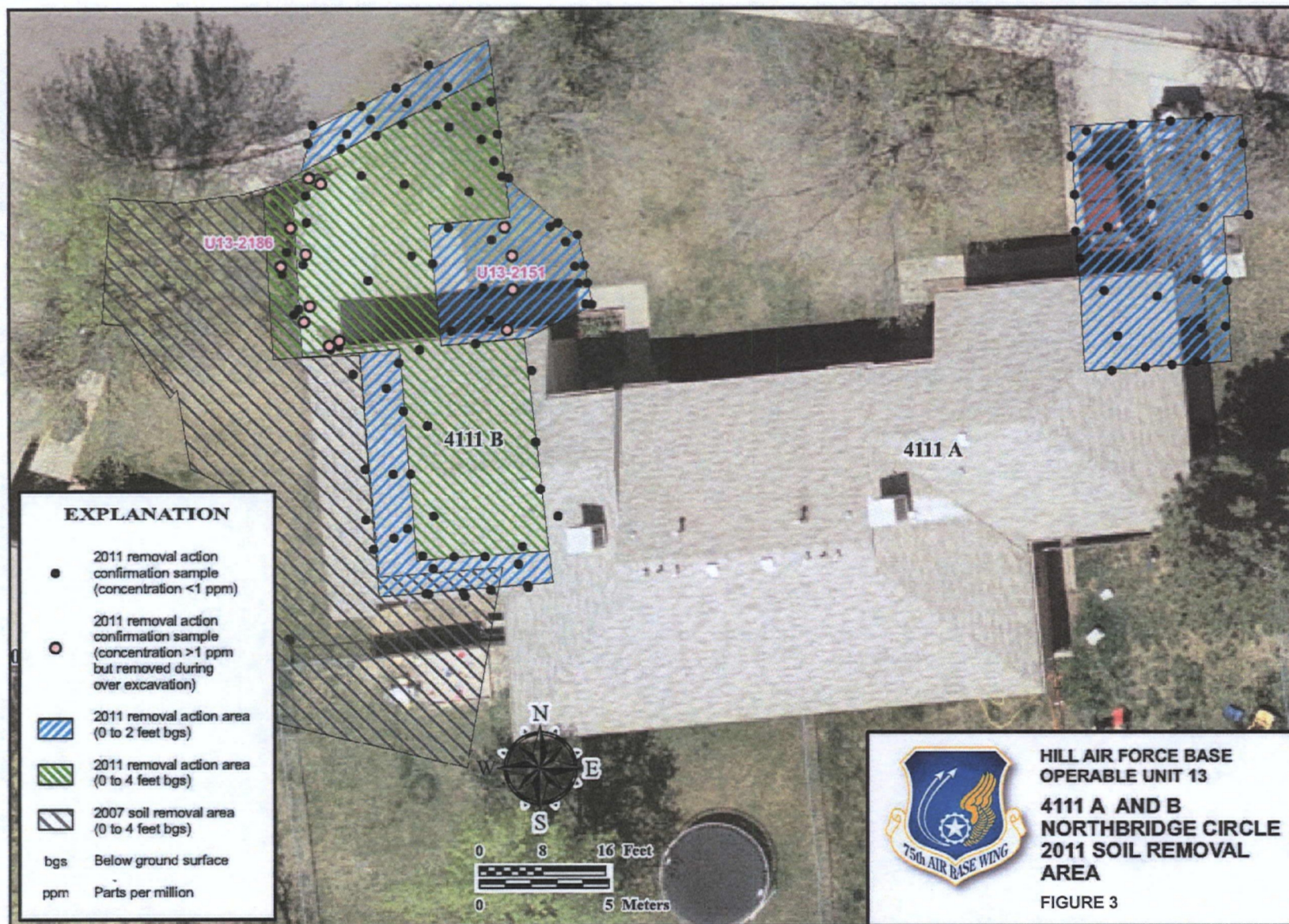


Figure 3. 4111 A and B North Bridge Circle soil removal areas (April 2011).





## TABLES

Table 1	Backfill Sample Results Summary, Backfill Material
Table 2	Backfill Analytical Results
Table 3	Confirmation Sample Results Summary, 4111B Northbridge Circle
Table 4	Confirmation Sample Results Summary, 4111 A Northbridge Circle
Table 5	Confirmation Sample Results Summary, 4114 B Charlestown Loop

Table 1. Backfill Sample Results Summary, Backfill Material.

Location ID	Collection Date	Location Description	Depth (ft)	Soil Sample Type	PCB Result* (mg/Kg)
U13-2198-0-1.5	2-May-11	Backfill	0-1.5	5-point composite	0.028F
U13-2199-0-1.5	2-May-11	Backfill	0-1.5	5-point composite	0.0247F
<p>* PCB results reflect concentration of Aroclor-1260</p> <p><b>Legend</b></p> <p>F - The result is between the method detection limit (MDL) and reporting limit (RL)</p> <p>mg/Kg - milligrams per kilogram</p>					



Table 2. Backfill Analytical Results (grab sample collected from the Geneva Rock Products Perry Pit).

**Inorganics-TCLP Metals**

Analysis	Units	Collection Date	Method	Reporting Limit	Analytical Result
Arsenic	mg/L	13 April 2011	1311/SW6020A	0.00300	<0.00300
Barium	mg/L	13 April 2011	1311/SW6020A	0.00200	0.343
Cadmium	mg/L	13 April 2011	1311/SW6020A	0.000900	<0.000900
Chromium	mg/L	13 April 2011	1311/6010C	0.0100	<0.0100
Lead	mg/L	13 April 2011	1311/SW6020A	0.00200	<0.00200
Mercury	mg/L	13 April 2011	1311/SW7470A	0.0100	<0.0100
Selenium	mg/L	13 April 2011	1311/SW6020A	0.00400	>0.00400
Silver	mg/L	13 April 2011	1311/SW6020A	0.00200	<0.00200

**Inorganics**

Analysis	Units	Date Sampled	Method	Reporting Limit	Analytical Result
Flashpoint	°F	13 April 2011	SW1010A	25.0	>200
pH @ 25 °C	pH units	13 April 2011	SW9045D	1.00	9.55
Reactive Cyanide	mg/Kg	13 April 2011	Sec 8.3	50.0	<50.0
Reactive Sulfide	mg/Kg	13 April 2011	Sec 8.3	100	<100
Total Recoverable Petroleum Hydrocarbons	mg/Kg-dry	13 April 2011	E1664A-GST	155	<155

**Organics-Herbicide TCLP List GC/ECD**

Analysis	Units	Date Sampled	Method	Reporting Limit	Analytical Result
2,4,5-TP	mg/L	13 April 2011	5151A/1311/3510C	0.00500	<0.00500
2,4-D	mg/L	13 April 2011		0.00500	<0.00500

Table 2. (continued).

**Organics-TCLP Pesticides**

Analysis	Units	Date Sampled	Method	Reporting Limit	Analytical Result
alpha Chlordane	mg/L	13 April 2011	8081B/1311/3510C	0.000500	<0.000500
Chlordane, total	mg/L	13 April 2011	8081B/1311/3510C	0.00500	<0.00500
Endrin	mg/L	13 April 2011	8081B/1311/3510C	0.000500	<0.000500
gamma BHC	mg/L	13 April 2011	8081B/1311/3510C	0.000500	<0.000500
gamma Chlordane	mg/L	13 April 2011	8081B/1311/3510C	0.000500	<0.000500
Heptachlor	mg/L	13 April 2011	8081B/1311/3510C	0.000500	<0.000500
Heptachlor epoxide	mg/L	13 April 2011	8081B/1311/3510C	0.000500	<0.000500
Methoxychlor	mg/L	13 April 2011	8081B/1311/3510C	0.000500	<0.000500
Toxaphene	mg/L	13 April 2011	8081B/1311/3510C	0.00625	<0.00625

**Organics-TCLP SVOA**

Analysis	Units	Date Sampled	Method	Reporting Limit	Analytical Result
2,4,5-Trichlorophenol	mg/L	13 April 2011	8270D/1311/3510C	0.0100	<0.0100
2,4,6-Trichlorophenol	mg/L	13 April 2011	8270D/1311/3510C	0.0100	<0.0100
2,4-Dinitrotoluene	mg/L	13 April 2011	8270D/1311/3510C	0.0100	<0.0100
2-Methylphenol	mg/L	13 April 2011	8270D/1311/3510C	0.0100	<0.0100
3&4-Methylphenol	mg/L	13 April 2011	8270D/1311/3510C	0.0100	<0.0100
Hexachlorobenzene	mg/L	13 April 2011	8270D/1311/3510C	0.0100	<0.0100
Hexachlorobutadiene	mg/L	13 April 2011	8270D/1311/3510C	0.0100	<0.0100
Hexachloroethane	mg/L	13 April 2011	8270D/1311/3510C	0.0100	<0.0100
Nitrobenzene	mg/L	13 April 2011	8270D/1311/3510C	0.0100	<0.0100
Pentachlorophenol	mg/L	13 April 2011	8270D/1311/3510C	0.0100	<0.0100
Pyridine	mg/L	13 April 2011	8270D/1311/3510C	0.0100	<0.0100